ENGINEERING ABSTRACTS

AMERICAN AGAR-AGAR

A humble Japanese mountaineer one chilly evening long ago was sitting close to his stove when there came a knock on the worn brown door of his hut. Opening, he beheld standing before him his Emperor, the Son of Heaven, shivering with a blue-nosed retinue. The Emperor was lost in the mountains. So honored was the mountaineer by the visit, so solicitous was he for his Emperor's health, that he set out an unusually large dish of his best seaweed jelly. When the meal was over the humble man, in deference to deity, threw away what the Son of Heaven could not eat. When the Emperor departed the next morning, the mountaineer, being thrifty, went after his lost delicacy. It had been frost-bitten during the night. As the morning sun warmed it, the jelly disintegrated. Water separated from it into a little pool leaving behind a light, glistening mass like delicate tissue-paper flowers. The mountaineer, who was a bit of a scientist, heated the residue in water, saw it resume its natural form, and laid the foundations for the great agar-agar industry of Japan. The fundamental process has not changed since the mountaineer's discovery.

Recently, George Robertson, professor of chemistry at the University of California at Los Angeles, reported to the American Chemical Society that California financiers and scientists are developing the ancient Japanese industry, and have built in California the only agar plant in the world outside of the Orient. Several years ago Japanese fishermen discovered some agar-bearing sea moss on the Los Angeles Harbor breakwater. Realizing that nostalgic Orientals in the United States love bird's-nest soup and knowing that agar-agar is an ingredient, they built a small factory, which Occidentals have taken over, moved, and modernized.

The source of United States agar is a dark red alga familiar along the beaches of southern California. The alga grows generally in turbulent waters, and must be picked by hand. Engineers are at present at work on a mowing machine which will stand rough seas, and make production cheaper. Often the alga grows in water 60 feet deep where only experienced divers can gather it. The factory has to pay $180 per ton to these sea-going harvest hands.

Agar is used chiefly as a culture medium in bacteriology because it keeps its form at higher temperatures than gelatin. Petroleum-agar, a familiar household intestinal lubricant, contains the substance in small quantities. It is useful in the making of glue, transparent silk, and paper.

—*Time.*

ELEVATOR INSTALLATION

When the new Empire State Building opens in New York City, visitors and workers will be served by a system of fifty-eight automatic elevators. These elevators will be capable of handling the twenty-five thousand workers who will be employed in the building as well as sixty thousand transient passengers. It is estimated that during the rush hour from five till five thirty o'clock, the elevators will lower fifteen thousand workers to the ground floor.

The elevators will be self starting, stopping, leveling and the doors will open and close automatically. Eleven of the cars will rise higher than any others have previously done.

The system of elevators will be constructed at a cost of four million dollars. At one time there were three hundred workers employed on elevator construction alone.

The cars will be supported by eight cables, any one of which is capable of bearing the weight of the car. Each car will be equipped with a telephone with connections to each floor, to the lobby, and to the superintendent of the building.

The law of the State of New York allows only a speed of 700 feet per minute, but in view of the fact that the law is sure to be changed, engineers have installed equipment which will make possible much greater speeds. Eighteen of the cars will be capable of a speed of eight hundred feet per minute, eighteen more will travel one thousand feet per minute and still eighteen more will be capable of twelve hundred feet per minute.

One of the freight elevators will rise from the basement to a height of 986 feet. This will be the greatest distance to be traveled by any elevator car in the world. An elevator which is being planned for the mooring mast atop the building will rise from the base of the mast to a point 1,210 feet from the street level.

—*Popular Science Magazine.*

A FLOATING POWER HOUSE

The New England Public Service Company, which owns and operates eighty generating stations in Maine, New Hampshire and Vermont, recently purchased the S. S. Jacona from the United States Shipping Board. Since that time they have replaced all the propelling equipment of the ship with electrical generating apparatus.

In order to eliminate the cost of purchasing and installing expensive electrical equipment in any of the eighty stations which might need temporary expansion, the company has hit upon a plan by which they can carry their equipment from city to city. The portable apparatus can thus be used to supply current in event of a breakdown at one of the stations or it may be used to bolster the current supply of one of the stations which is under a heavy seasonal demand.

The ships propelling equipment was replaced with four Babcock and Wilson marine type boilers, each heated with eleven fuel oil burners. The old boiler room of the boat was used for the installation of two turbo generators of 10,000 K.W. capacity.

In operation, the ship is towed to the dock where provisions have been made for connection with the company's line. The connection is made and the equipment is placed in immediate use. A 250,000 gallon tank on the boat will supply the

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burners for five days. The connections from the ship to the dock will allow for a rise or fall of eighteen feet in the tide.

At present the equipment is docked at Bucksport, Maine, where current is supplied to a recently constructed paper mill.

—*Scientific American.*

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RADICAL AEROCAR DESIGNED FOR ALL-PURPOSE FLYING

The aerocar invented by Wilber G. Nelson flies without having any wings or propellers. This is compensated by the ship having two sets of revolving planes from which the cabin is suspended. The aerocar weighs only about five hundred pounds, will travel fifty miles on one gallon of gas, and has a maximum speed of one hundred miles per hour.

The ship remains aloft by means of the revolving planes which travel at the same speed in opposite directions. The ship will ascend and descend by having the planes in a horizontal position and will travel on a horizontal line by tilting the planes forward. The planes cut the air much faster than the wings of an ordinary airplane, thereby giving much more lift per square foot of plane surface. This feature is expected to reduce the horsepower to operate a three passenger ship with a total weight of 1200 pounds.

The cabin assumes no position except the upright one, eliminating the dangers of a nose and tail spin. Should the motor stop, the vacuum above the rotating planes would bring the ship gently to the ground. Several tests in the ship have proven successful and a similar craft will be used in the near future for a transcontinental flight.

—*Popular Aviation.*

SWANTY AIR SUBJECTOR

Mr. Alfred Swanty has invented a device to supply oxygen to the burning charge in an internal combustion engine by injecting air into the cylinder after the intake has closed and combustion started.

A two-cylinder, twelve horsepower Palmer marine engine equipped with the Swanty Air Subjector developed nearly twice as much power as without it. Similar tests were made with a Ford automobile engine with equally satisfactory results. It is estimated that an engine of the same bore and stroke equipped with the device will show at wide open throttle a power increase of 80 per cent in horsepower over one without it. At different lower throttle settings, an increase as high as 500 per cent in horsepower is estimated.

The Ohio State Aeronautical Society is being reorganized under the leadership of M. W. Lawrence, president of the club, in hopes that it will again regain national recognition such as it held in 1928 when it held an intercollegiate cross-country race and the National Convention here in Columbus. Much enthusiasm has been manifested by the students at the last several meetings in which Lieutenant Davis of Port Columbus gave a talk on Flying Clubs and Opportunities in Aviation with stress on the work of the aeronautical engineer. He has offered his help and influence in the establishment of a recognized flying club on the campus of Ohio State University.

L. P. Doyle is still connected with the Westinghouse Electric & Manufacturing Company and is located at the Chicago office, 20 N. Wacker Drive, Chicago, Ill. He is handling some important railway work at the present time.